

Original Research Article

Study of cases of foot eczema by patch test

S. Suryanarayan^{1*}, P. Ramchander², Yajhitha Rammanchintala³,
P. Praneeth Kumar Reddy⁴, Swetha⁴

¹Associate Professor, ²Assistant Professor, ³Resident, ⁴Senior Resident
Department of Dermatology, Government General Hospital, Nizamabad, India

*Corresponding author email: suryanarayanasesompalli@gmail.com

	International Archives of Integrated Medicine, Vol. 2, Issue 11, November, 2015. Copy right © 2015, IAIM, All Rights Reserved. Available online at http://iaimjournal.com/	
	ISSN: 2394-0026 (P)	ISSN: 2394-0034 (O)
	Received on: 20-10-2015	Accepted on: 02-11-2015
	Source of support: Nil	Conflict of interest: None declared.
How to cite this article: Suryanarayan S, Ramchander P, Rammanchintala Y, Reddy PPK, Swetha. Study of cases of foot eczema by patch test. IAIM, 2015; 2(11): 57-60.		

Abstract

Background: Foot eczema is one of the most common problems encountered by dermatologists and poses difficult problem in identification of causative agent and complete treatment.

Materials and methods: This study was conducted over a period of 6 months with 30 patients included in the study of which 18 were males and 12 females of ages ranging from 11 to 60 years. 20 allergens of CODFI were used for testing and evaluation of the results on these patients.

Results: Patch test was positive in 60% of patients, which is essential for identification of the causative agent and prevention of eczema. Out of 20, only 5 allergens showed positive reaction in the present study.

Conclusion: Patch testing plays a major role in identification of causative agent in foot eczema, which in turn will helps in avoiding the agent and cure of the disease.

Key words

Foot eczema, Patch test, Allergens, Allergic contact dermatitis.

Introduction

Foot eczema is one of the most common eczema, encountered in Dermatology-OP. Some forms of eczemas are altered by variation in structure and function of skin and these may modify in regions such as hands and feet [1]. Hands and feet are more vulnerable to eczema due to repeated contact with exogenous agents.

Eczema is a pattern of cutaneous inflammation that presents with erythema, vesiculation and pruritus in acute phase. Its chronic phase is characterized by dryness, scaling and fissuring. Allergic contact dermatitis (ACD) is cell mediated, hypersensitivity reaction caused by skin contact with environmental allergen. Prior sensitization is required for allergy to develop.

The clinical manifestation is eczematous dermatitis. Hands, feet and face are common sites for ACD. Patch test is fundamental for identification of causative allergen and is indicated in persistent and recurrent dermatitis. Avoidance is main stay of treatment. Educating about the avoidance of allergen and providing suitable alternatives are crucial to good outcome [2]. This study was undertaken to evaluate role of patch test in foot eczema for early identification of the allergen causing foot eczema.

Materials and methods

A total of 30 patients of foot eczema of both sex, attending the Out Patient Department of DVL at Government General Hospital, Nizamabad, during the period between April to September 20015, were enrolled in the present study.

Inclusion criteria

- Patients clinically had foot eczema
- Patients who were willing for patch test

Patients with active dermatitis were first treated and then subjected to patch test so as to avoid false positivity and excited skin syndrome (angry back syndrome).

Exclusion criteria

- Patients had pre existing skin disorders
- Patients who refused patch test
- Patients on immunosuppressive therapy
- Female patients who were pregnant

A detailed history of each patient was recorded in the proforma specially designed for the study including particulars about present complaints and duration, seasonal variation, medicaments used for pre existing lesions, childhood eczema and atopy in self and family members. A detailed occupational history including the agents used in work environment and their association with ACD were recorded. Comprehensive account of various items used routinely such as chemicals, detergents, cleansers, medicaments etc., was recorded and its relevance to the clinical presentation was assessed. Hobbies and part time jobs like gardening, automotive repairs,

construction or masonry, painting and wood work were also recorded.

A complete clinical examination was carried out in all patients and details about the nature, extent and morphology of the lesions were carefully noted down. Further their relevance were assessed and evaluated for probable contact agents in the individual patients. The routine haematological and urine investigations were done. The patients were later subjected to patch test after obtaining the consent. Antigens used for the procedure included standard screening tray of 20 antigens approved by contact and occupational dermatosis forum of India (CODFI) and also the suspected agents in the individual patients.

Procedure

The procedure established by the International contact dermatitis research group (ICDRG) was adopted throughout the study. The standard antigens were put in the aluminium patch test chamber (APC) to fill 3/4ths of chamber. 10 such APCs were placed facing up with 2 cm. distance from the centre of each other in 2 columns.

The test unit thus prepared were struck on the upper back of patient in vertical rows in paravertebral position. Excessive hair if present was shaved prior to sticking of tape. Care was taken to avoid any folds on the strip. The patient was made to bend slightly forward and the lower end of the tape was applied first and then the tape was pressed against the skin and finally the uppermost border was applied at the end. The patients were advised not to undertake washing of the back and any strenuous exercise that may cause excessive sweating.

Skin marking and exposure time

Marking as per the proforma was done in numerals over the APC with skin marking pencil. An occlusion time of 48 hours was allowed and later the chambers were opened after the patient returned back to hospital.

Time of reading

To avoid missing of weak positive patch test reaction, the first reading of the results were taken after 48 hours (with a waiting period of 45 minutes after removal of the patches) when the skin depression due to occlusion has disappeared. These sites were then marked with a skin marking pencil and the patient was asked to return 24 hours later to the hospital and second reading of the patch test results was recorded.

Recording of the result

The patch test site was examined carefully at 48 and 72 hours after application and the changes were graded according to the criteria laid down by ICDRG and described below.

- (-) negative reaction
- (?) Doubtful-erythema only
- (+) weak –erythema infiltration papules
- (++) strong-oedema or vesiculation
- (+++) extreme-ulcerative or bullous

Results

Total 30 cases were taken into study, the age and sex distribution was as per **Table - 1**. Patch test was positive in 18 subjects (60%) of which 12 are males and 6 female patients. The highest positive reaction with five out of twenty antigens of CODFI was observed. They were potassium dichromate, MBT, thiuro, black rubber and nickel as per **Table - 2**. Out of 14 construction labours, 12 were showed positive patch test. Two each of 4 gardeners and 6 mechanics and 6 wood workers were positive for patch test as per **Table - 3**. Six out of eight patients with papules were positive for patch test, while all the six patients with vesicles were Positive for patch test. Out of 6 patient with erythematous and bullae two patient and three patients consecutively were positive for patch test. Only one patient showed positive patch test out of four patients with ulcerative lesion as per **Table - 4**.

Discussion

The most common age group of presentation of foot eczema in our study was between 21-30 years, which was in accordance with other

studies [3, 4]. The allergic contact dermatitis of legs and foot is mainly associated with use of foot wear [5]. Several authors have reported that rubber based adhesives that are universally used in the shoe industry are apparently the cause of shoe dermatitis leading to foot eczema [6, 7]. The foot eczema observed in workers of building construction site in this study was similar to that of ‘Calman CD in cement dermatitis’ [8].

Table - 1: Age and sex distribution of subjects.

Age (Years)	Males	Females	Total
11-20	2	1	3
21-30	6	4	10
31-40	3	3	6
41-50	4	3	7
51-60	3	1	4
Total	18	12	30

Table - 2: Sex wise distribution of positive allergen agents.

Antigens	Males	Females	Total
Potassium dichromate	4	3	7
MBT	3	-	3
Thiuram	3	2	5
Black rubber	2	-	2
Nickel	-	1	1
Total	12	6	18

Table - 3: Occupation wise distribution of positive patch test.

Occupation	No. of study group	No. of positive patch test
Gardener	4	2
Automotive mechanic	6	2
Construction labour	14	12
Wood work labour	6	2
Total	30	18

Table - 4: Clinical sign by positive patch test.

Clinical sign	No. of study group	No. of positive patch test
Erythematous patch	6	2
papules	8	6
vesicles	6	6
Bullae	6	3
Ulcer	4	1
Total	30	18

In a study done by Chowdary S, et al. [9], Bajaj, et al. [7], potassium dichromate was found to be commonest allergen for foot eczema which is in accordance with the present study. In a study by Ethan, et al. [10], showed that MBT and nickel sulphate were frequent sensitizers, which were shown in the second position in our study. The construction labour was commonly affected with food eczema due to contact allergen and same was observed in study by Calman [8]. Mechanics, wood work labour, gardeners are also affected with foot eczema due to shoes. Commonest clinical presentation was papules, vesicles, bullae and erythematous patch. Only few Patients ulcerative Lesions were observed. All the patients with vesicles were positive for patch test and patient with erythematous patch, papule and bullae showed lesser positive test.

Conclusion

Foot eczemas are common in allergic contact dermatitis group. Foot wear is the most common cause of foot eczema. Patch testing plays a major role in finding the causative allergen of foot eczema, which otherwise the condition becomes recurrent and chronic because of constant irritation with allergen contact, leading to chronic eczematization of foot and prolonged treatment, thereby hindering the working ability of construction labour. Hence patch test, a simple test which can be done in OPD is recommended for all foot eczema cases evaluation for early identification of contact allergen. Thus, helping in educating the avoidance of allergens and providing alternatives is useful to prevent the

contact dermatitis in foot eczema. The test also helps the clinician to cure the patient successfully with local and systemic medication and avoidance of allergen.

References

1. Holden CA, Berth-Jones J. Eczema lichenification prurigo and erythroderma; In: Burns T, Breathnach S, Conn, Griffiths C, editors, Rooks Text Book of Dermatology, 7th edition, Oxford; Black well publishing; 2004, p.17.
2. Castanedo Tardan MP, Zug K. Allergic contact dermatitis. In: Goldsmith LA, Katz SI, Gilchrist BA, Palle AS, Leffel DJ, Wolf K editors. Fitzpatrick's dermatology in general medicine, 8th edition, Newyork; Mc Graw-Hill, 2002, p. 152.
3. Hand S, et al. Foot wear dermatitis clinical patterns and contact allergens. IJDVL, 1991; 57: 174-7.
4. Hanifin JM, Reed ML. A Population based survey of eczema prevalence in the United States. Dermatitis, 2007; 82: 82-91.
5. Retschal RL, fowler JF Jr. Textile and shoe dermatitis, Fischer contact dermatitis. 5th edition, Philadelphia; Lippincott Williams and Wilkins, 2001, p. 412-52.
6. Romaguera C. Shoe contact dermatitis. Int. J. Dermatology, 1987; 26: 533-5.
7. Bajaj AK, Gupta SC, Chatterjee AK, Singh KG. Shoe dermatitis in India. Contact dermatitis, 1988; 19: 371-5.
8. Calman CD. Cement dermatitis. Jr. of Occup. Med., 1960; 2: 15.
9. Chowdary S, Ghosh S. Epidemiological study in 155 cases of footwear dermatitis. IJDVL, 2007; 73: 319-22.
10. Epan BR, Shenoy SD, Sandra A. Patch testing with shoe series in suspected cases of footwear dermatitis. Indian Jr. of Dermatology, 2000; 45: 146-8.